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IN RE APPLICATION OF: Jesse Sandoval

SERIAL NO.: 09/820,477

RESPONSE TRANSMITTAL AND
EXTENSION OF TIME REQUEST
(IF REQUIRED)

TITLE: DATA PACKET CONGESTION MANAGEMENT TECHNIQUE

FILED: March 28, 2001

EXAMINER: Levitan, D.

ART UNIT: 2662

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Total Claims	20 minus	20 =	0 x \$ 50.00	\$ 0.00
Independent Claims	3 minus	3 =	0 x \$200.00	\$ 0.00
Multiple Dependent Claim First Added			+ \$360.00	\$ 0.00

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Registration No.: 42,829I hereby certify that this letter, the response or amendment attached hereto are being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 8, 2005.By: 

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Our Docket No.: 99-413 / 1496.00062

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Applicant: Jesse Sandoval

Application No.: 09/820,477

Examiner: Levitan, D.

Filed: March 28, 2001

Art Group: 2662

For: DATA PACKET CONGESTION MANAGEMENT TECHNIQUE

CERTIFICATE OF MAILING

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By:

Jan M. Dunbar
Jan M. Dunbar

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APPEAL BRIEF

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Dear Sir:

Appellant submits the following Appeal Brief pursuant to 37 C.F.R. §41.37 for consideration by the Board of Patent Appeals and Interferences. Please charge \$500.00 to cover the cost of filing the opening brief as required by 37 C.F.R. §41.20(b)(2) and any additional fees or credit any overpayment to Deposit Account Number 12-2252.

Docket Number: 99-413 / 1496.00062

Application No.: 09/820,477

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I. REAL PARTY IN INTEREST

The real party in interest is the Assignee, LSI Logic Corporation.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the Appellant, Appellant's legal representative, or Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1, 2, 4-12 and 14-22 are pending and remain rejected. The Appellant hereby appeals the rejection of claims 1, 2, 4-12 and 14-22.

IV. STATUS OF AMENDMENTS

Appellant is appealing a Final Office Action issued by the Examiner on March 9, 2005. On May 6, 2005, Appellant filed an Amendment After Final. The Examiner issued an Advisory on June 1, 2005 indicating that claim changes in the Amendment After Final were not entered. On June 9, 2005, Appellant filed a Notice of Appeal based on the last set of claims prior to the Amendment After Final.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A first embodiment of the present invention (as represented by claim 1) generally concerns a circuit 106 for data packet management. The circuit 106 generally comprises a buffer 126 and a test circuit 106. The buffer 126 may store a plurality of data packets received in a signal DATA. Operations of the buffer 126 are generally described in the text on page 6, line 20 through page 7, line 2. The test circuit 120 may be configured to (i) monitor 132 a number of the plurality of data packets in the buffer 126, (ii) receive 130 an additional data packet to the plurality of data packets, (iii) store 142 the additional data packet into the buffer 126 responsive to the number being less than a first threshold (the YES branch of decision block 140), (iv) discard 152 the additional data packet in accordance with a probabilistic test 156 responsive to the number being greater than the first threshold (the FAIL branch of decision block 156) and (v) present 154 an identification signal ID to a sender 102 of the additional data packet identifying the additional data packet as discarded. Details of the operation for the test circuit 120 are provided in FIG. 2 and the associated text on page 7, line 13 through page 10, line 21.

A second embodiment of the present invention (as represented by claim 11) generally concerns a method for managing congestion of a plurality of data packets in a buffer 126. The data packets may be carried in a signal DATA. A first step of the method generally comprises (A) monitoring 132 a number of the plurality of data packets in the buffer as illustrated in FIG. 2 and described in the text on page 8, lines 1-3. Another step may comprise (B) receiving 130 an additional data packet to the plurality of data packets as described on page 8, lines 1-3. A third step may comprise (C) storing 142 the additional data packet into the buffer in response to the number

being less than a first threshold. Determining that the number is less than the first threshold is shown as the YES branch of decision block 140 and described on page 8, lines 18-21. The storing is also described on page 8, lines 18-21. A fourth step may include (D) discarding 152 the additional data packet in accordance with a probabilistic test 156 without the additional data packets reaching the buffer 126 in response to the number being greater than the first threshold. Failing probabilistic test is generally illustrated by the FAIL branch of decision block 156. The fourth step is discussed on page 10, lines 7-14. Another step generally comprises (E) presenting 154 an identification signal ID to a sender 102 of the additional data packet identifying the additional data packet as discarded. Presentation of the signal ID is discussed on page 10, lines 14-16.

A third embodiment of the present invention (as represented by claim 17) generally concerns a circuit 106 for data packet congestion management. The data packets may be carried to the circuit 106 in a signal DATA. The circuit 106 generally comprises means for monitoring a number of a plurality of data packets in a buffer 126; means for receiving an additional data packet to the plurality of data packets; means for storing the additional data packet into the buffer 126 in response to the number being less than a first threshold (the YES branch of decision block 140); means for discarding the additional data packet without storing the additional data packets in the buffer 126 in accordance with a probabilistic test in response to the number being greater than the first threshold (the FAIL branch of decision block 156); and means for presenting an identification signal ID identifying the additional data packet as discarded. All of the means for may be implemented by a test circuit 120. Details of the operation for the test circuit 120 are provided in FIG. 2 and the associated text on page 7, line 13 through page 10, line 21.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The first issue is whether claims 1, 2, 4, 9, 11, 12, 14, 16, 17 and 20 are patentable under 35 U.S.C. §102(e) over Lyon et al. (hereafter Lyon), U.S. Patent No. 6,333,917.

The second issue is whether claims 6-8 are patentable under 35 U.S.C. §103(a) over Lyon in view of Skirmont, U.S. Patent No. 6,252,848.

The third issue is whether claims 5, 10, 15, 18 and 19 are patentable under 35 U.S.C. §103(a) over Lyon in view of Ikeda, U.S. Patent No. 5,719,853.

The fourth issue is whether claims 21 and 22 are patentable under 35 U.S.C. §103(a) over Lyon in view of Bechtolsheim et al. (hereafter Bechtolsheim), U.S. Patent No. 6,515, 963.

VII. ARGUMENTS

A. Rejections under 35 U.S.C. § 102

The Federal Circuit has stated that “[t]o anticipate, *every element and limitation* of the claimed invention must be found in a single prior art reference, *arranged as in the claim.*”¹ (Emphasis added). The Federal circuit has added that the anticipation determination is viewed from one of ordinary skill in the art: “There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.”²

¹ *Brown v. 3M*, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) citing *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 USPQ2d 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991) (Emphasis added by Appellant).

² *Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991).

Furthermore, “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”³

1. Claims 1, 4, 9 and 20 fully patentable over Lyon

Claim 1 provides a test circuit configured to present an identification signal to a sender of an additional data packet identifying the additional data packet as discarded. In contrast, Lyon appears to be silent and the Examiner offers no evidence that Lyon expressly or inherently discloses that (i) a Drop/Tag block 40 plus a RED engine 38 (asserted similar to the claimed test circuit) generates an identification signal back to a source 32 (asserted similar to the claimed sender) or (ii) sends any signal identifying a packet as discarded. Therefore, Lyon does not disclose or suggest a test circuit configured to present an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Furthermore, the “implicit signal” mentioned by the Examiner⁴ appears to be a function of the TCP protocol rather than the RED engine 38 of Lyon. According to the *Encyclopedia of Networking, Electronic Edition*, page 951 (see Appendix IX), “The receiver can *acknowledge* receipt of datagrams to provide assurance of delivery to the sender.” If the RED engine 38 of Lyon discards a packet, the source 32 of Lyon would decide on its own that the data packet is missing. Lyon appears to disclose a different structure than claim 1 that does not use the claimed identification signal. Therefore, Lyon does not disclose or suggest a test circuit configured to present an

³ *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, USPQ2d 1051, 1053 (Fed Circ. 1987).

⁴ Final Office Action, March 9, 2005, page 3, paragraph d.

identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Assuming, *arguendo*, that the “implicit signal” of Lyon is somehow presented from the Drop/Tag block 40 plus the RED engine 38 (asserted similar to the claimed test circuit) to the source 32 (asserted similar to the claimed sender) (for which Appellant’s representative does not necessarily agree), the “implicit signal” of Lyon still does not identify the data packet as discarded. The “implicit signal” of Lyon, actually an operation of the TCP protocol, merely indicates that the packet has not yet been received at the intended destination. The “implicit signal” of Lyon does not appear to convey any indication that the data packet was discarded. In particular, the absence of the acknowledge signal does not necessarily indicate that the data packet has been discarded. For example, the data packet may still be in a buffer somewhere in the system and so no acknowledge signal is generated. Therefore, Lyon does not disclose or suggest a test circuit configured to present an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

In summary, Lyon does not explicitly or inherently disclose a signal similar to the claimed identification signal. The “implicit signal” of Lyon does not appear to be presented to a sender. Furthermore, no signal in Lyon appears to identify a data packet as discarded. As such, the claims are fully patentable over the cited reference and the rejection should be reversed.

2. Claims 11, 14 and 16 are fully patentable over Lyon

Claim 11 provides a step for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded. In contrast, Lyon appears to be silent and the Examiner offers no evidence that Lyon expressly or inherently discloses any item that (i) generates an identification signal back to a source 32 (asserted similar to the claimed sender) or (ii) sends any signal identifying a packet as discarded. Therefore, Lyon does not disclose or suggest a step for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Furthermore, the “implicit signal” mentioned by the Examiner⁵ appears to be a function of the TCP protocol. According to the *Encyclopedia of Networking, Electronic Edition*, page 951 (see Appendix IX), “The receive can *acknowledge* receipt of datagrams to provide assurance of delivery to the sender.” If the RED engine 38 of Lyon discards a packet, the source 32 of Lyon appears to perform some type of internal time-out operation waiting for the acknowledge packet. Neither the TCP protocol or Lyon appear to present a signal when a packet is discarded. Lyon appears to disclose a different process than claim 11 that does not use the claimed identification signal. Therefore, Lyon does not disclose or suggest a step for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Assuming, *arguendo*, that the “implicit signal” of Lyon is somehow presented from some unidentified item in Lyon to the source 32 (asserted similar to the claimed sender) (for which Appellant’s representative does not necessarily agree), the “implicit signal” of Lyon still does not

⁵ Final Office Action, March 9, 2005, page 3, paragraph d.

identify the data packet as discarded. The “implicit signal” of Lyon, actually an operation of the TCP protocol, merely indicates that the packet has not been received at the intended destination. In particular, the absence of the acknowledge signal does not necessarily indicate that the data packet has been discarded. For example, the data packet may still be in a buffer somewhere in the system and so no acknowledge signal is generated. Therefore, Lyon does not disclose or suggest a step for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

In summary, Lyon does not explicitly or inherently disclose a signal similar to the claimed identification signal. The “implicit signal” of Lyon does not appear to be presented to a sender. Furthermore, no signal in Lyon appears to identify a data packet as discarded. As such, the claims are fully patentable over the cited reference and the rejection should be reversed.

3. Claim 17 is fully patentable over Lyon

Claim 17 provides a means for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded. In contrast, Lyon appears to be silent and the Examiner provides no evidence that Lyon expressly or inherently discloses a circuit that (i) generates an identification signal back to a source 32 (asserted similar to the claimed sender) or (ii) sends any signal identifying a packet as discarded. Therefore, Lyon does not disclose or suggest a means for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Furthermore, the “implicit signal” mentioned by the Examiner⁶ appears to be a function of the TCP protocol rather than some unidentified circuit of Lyon. According to the *Encyclopedia of Networking, Electronic Edition*, page 951 (see Appendix IX), “The receiver can *acknowledge* receipt of datagrams to provide assurance of delivery to the sender.” If the RED engine 38 of Lyon discards a packet, the source 32 of Lyon would appear to generate some type of internal time-out signal waiting for the acknowledge packet. Lyon appears to disclose a different structure than claim 17 that does not use the claimed identification signal. Therefore, Lyon does not disclose or suggest a means for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

Furthermore, the Examiner fails to meet an “initial” burden of proof for showing that the prior art structure or step is the same as or equivalent to the structure, material, or acts described in the specification which has been identified as corresponding to the claimed means or step plus function.”⁷ The Examiner has not shown the Lyon discloses a structure similar to the claimed means for presenting the identification signal, and thus *prima facie* anticipation has not been established.

Assuming, *arguendo*, that the “implicit signal” of Lyon is somehow presented from some unidentified circuit of Lyon to the source 32 (asserted similar to the claimed sender) (for which Appellant’s representative does not necessarily agree), the “implicit signal” of Lyon still does not identify the data packet as discarded. The “implicit signal” of Lyon, actually an operation of the TCP protocol, merely indicates that the packet has not been received at the intended destination. In

⁶ Final Office Action, March 9, 2005, page 3, paragraph d.

⁷ Manual of Patent Examining Procedure (M.P.E.P.), Eighth Edition, Rev. 2, May 2004, §2182.

particular, the absence of the acknowledge signal does not necessarily indicate that the data packet has been discarded. For example, the data packet may still be in a buffer somewhere in the system and so no acknowledge signal is generated. Therefore, Lyon does not disclose or suggest a means for presenting an identification signal to a sender of an additional data packet identifying the additional data packet as discarded as presently claimed.

In summary, Lyon does not explicitly or inherently disclose a signal similar to the claimed identification signal. The “implicit signal” of Lyon does not appear to be presented to a sender. The Examiner has not provided any evidence or arguments per M.P.E.P. §2182 that Lyon discloses a structure similar to the claimed means for presenting. Furthermore, no signal in Lyon appears to identify a data packet as discarded. As such, the claim is fully patentable over the cited reference and the rejection should be reversed.

4. Claims 2 and 12 are fully patentable over Lyon

Claim 2 depends from claim 1 and thus contains all of the limitations of claim 1. Consequently, the arguments presented above in support of the patentability of claim 1 are incorporated hereunder in support of claim 2.

Claim 12 depends from claim 11 and thus contains all of the limitations of claim 11. Consequently, the arguments presented above in support of the patentability of claim 11 are incorporated hereunder in support of claim 12.

The claims further provide discarding the additional data packet in response to a number being at least as great as a second threshold. In contrast, Lyon states in column 2, lines 1-2, “If the

average queue size exceeds the maximum threshold, all arriving packets are marked.” Lyon further states in column 1, lines 61-66 that marking can be accomplished using an Explicit Forward Congestion Indication field in the ATM cells. Lyon appears to contemplate that additional packets **can be kept** even if the average queue depth is above the maximum threshold (asserted similar to the claimed second threshold). Therefore, Lyon does not appear to disclose or suggest discarding the additional data packet in response to a number being at least as great as a second threshold as presently claimed. As such, the claims are fully patentable over the cited reference and the rejection should be reversed

B. Rejections under 35 U.S.C. §103

The Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.⁸ If the Examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of non-obviousness.⁹ “[T]o establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicants.”¹⁰ “[T]he factual inquiry whether to combine references must be thorough and searching.”¹¹ “This

⁸ M.P.E.P., Eighth Edition, Rev. 2, May 2004, §2142.

⁹ *Id.*

¹⁰ *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) (citing *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)).

¹¹ *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001).

factual question ... [cannot] be resolved on subjective belief and unknown authority.”¹² “It must be based on objective evidence of record.”¹³ The Examiner must show that (a) there is some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references, (b) there is a reasonable expectation of success, and (c) the prior art reference (or combination of references) teaches or suggests all of the claim limitations.¹⁴ “The motivation, suggestion or teaching may come explicitly from statement in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved.”¹⁵

The Federal Circuit has held that both the suggestion to modify or combine the references and the reasonable expectation of success must be found in the prior art itself, not merely in Appellant’s disclosure.¹⁶ Furthermore, the Court of Appeals for the Federal Circuit has indicated that the requirement for showing the teaching of motivation to combine references is “rigorous” and must be “clear and particular.”¹⁷ Furthermore, the Board has held that the claimed invention is obvious only if either the references expressly or implicitly suggest the claimed invention, or a

¹² *In re Lee*, 277 F.3d 1338, 1343-44, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

¹³ *Id.* at 1343, 61 USPQ2d at 1434.

¹⁴ M.P.E.P., Eighth Edition, Rev. 2, May 2004, §2142.

¹⁵ *In re Huston* 308, F.3d 1267, 1278, 64 USPQ2d 1810, 1810 (Fed. Cir. 2002), citing *In re Katzab* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000)

¹⁶ See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991).

¹⁷ *In re Anita Dembiczak and Benson Zinbarg*, 50 USPQ2d 1614 (Fed. Cir. 1999).

convincing line of reasoning is presented by the examiner as to why an artisan would have found the claimed invention to be obvious in light of the teachings of the cited references.¹⁸

1. Claims 6, 7 and 8 are fully patentable over Lyon and Skirmont

The Examiner has not provided clear and particular evidence of motivation to combine the references. In particular, the alleged motivation to improve the system performance by “adjusting the packets dropping to meet different system requirements”¹⁹ does not appear to be credited to the references or knowledge generally available to one of ordinary skill in the art as required by M.P.E.P. §2142. Furthermore, the need for “adjusting the packets dropping to meet different system requirements” does not appear to be expressed by any of the references as a problem to be solved per *In re Huston*. Still further, one of ordinary skill in the art would appear to understand that meeting system requirements establishes a baseline system performance. To “improve” the system performance, the proposed modification/combination would have to exceed the baseline system performance. No evidence has been provided that the proposed modification/combination would provide a performance increase above the baseline. Therefore, the alleged motivation appears to be merely a conclusory statement. As such, *prima facie* obviousness has not been established for lack of clear and particular evidence of motivation to combine the references and the rejection should be reversed.

¹⁸ See *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985) (emphasis added by Appellant).

¹⁹ Final Office Action, March 9, 2005, page 4, lines 3-4.

2. Claims 5, 10, 15, 18 and 19 are fully patentable over Lyon and Ikeda

The Examiner has not provided clear and particular evidence of motivation to combine the references. In particular, the alleged motivations (i) “to reduce unnecessary packet transmission from the source when the buffer is full”²⁰ and (ii) “to utilize full packet transmission rate from the source in the absence of congestion”²¹ do not appear to be credited to the references or knowledge generally available to one of ordinary skill in the art as required by M.P.E.P. §2142. Furthermore, the need to “reduce unnecessary packet transmission” and “utilize full packet transmission rate from the source” do not appear to be expressed by any of the references as problems to be solved per *In re Huston*. Still further, neither Lyon or Ikeda appear to teach a threshold indicating a full buffer. Therefore, the alleged motivations appear to be merely conclusory statements. As such, *prima facie* obviousness has not been established for lack of clear and particular evidence of motivation to combine the references and the rejection should be reversed.

3. Claims 21 and 22 are fully patentable over Lyon and Bechtolsheim

The Examiner has not provided clear and particular evidence of motivation to combine the references. In particular, the alleged motivation “to improve system performance when interfacing to several output ports”²² does not appear to be credited to the references or knowledge generally available to one of ordinary skill in the art as required by M.P.E.P. §2142. Furthermore, the need

²⁰ Final Office Action, March 9, 2005, page 5, lines 6-7.

²¹ Final Office Action, March 9, 2005, page 5, last two lines.

²² Final Office Action, March 9, 2005, page 4, paragraph 5.

for “interfacing to several output ports” does not appear to be expressed by any of the references as problems to be solved per *In re Huston*. Therefore, the alleged motivation appears to be merely a conclusory statement.

Furthermore, one of ordinary skill in the art would appear to be unmotivated to make the proposed combination. In particular, column 2, lines 26-33 of Bechtolsheim asserts that a port scheduler 50 provides a “statistically fair scheduling process” such that “one packet is read out of each queue, one queue at a time.” In contrast, Lyon only appears to disclose a single queue 36. One of ordinary skill in the art would appear to be *unmotivated* to add the cost and complexity of the port scheduler 50 of Bechtolsheim to the switch 34 of Lyon where there is only a single queue 36 from which to read out the packets. Therefore, *prima facie* obviousness has not been established due a motivation *not* to combine the references. As such, the rejection should be reversed.

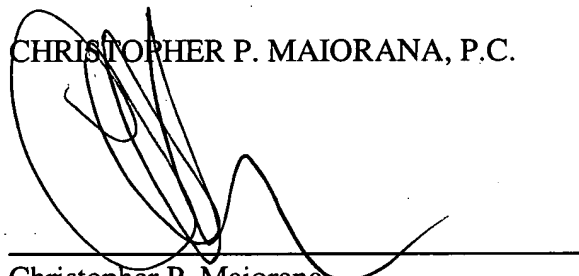
C. Conclusion

Lyon does not expressly or inherently disclose presenting an identification signal to a sender of an additional data packet as presently claimed. Lyon does not expressly or inherently disclose an identification signal that identifies a data packet as discarded. Furthermore, the no clear and particular evidence of motivation has been established to modify/combine the cited references. Hence, the Examiner has clearly erred with respect to the patentability of the claimed invention. It is respectfully requested that the Board overturn the Examiner’s rejection of all pending claims, and hold that the claims are not rendered obvious by the cited reference. However, should the Board find

the arguments herein in support of independent claims 1, 11 and/or 17 unpersuasive, the Board is respectfully requested to carefully consider the arguments set forth above in support of each of the independently patentable groups.

Respectfully submitted,

CHRISTOPHER P. MAIORANA, P.C.



Christopher P. Maiorana
Registration No. 42,829

Dated: August 8, 2005

c/o Henry Groth
Intellectual Property Law Department
LSI Logic Corporation
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VIII. CLAIM APPENDIX

The claims of the present application which are involved in this appeal are as follows:

1 1. A circuit comprising:
2 a buffer for storing a plurality of data packets; and
3 a test circuit configured to (i) monitor a number of said plurality of data packets in
4 said buffer, (ii) receive an additional data packet to said plurality of data packets, (iii) store said
5 additional data packet into said buffer responsive to said number being less than a first threshold,
6 (iv) discard said additional data packet in accordance with a probabilistic test responsive to said
7 number being greater than said first threshold and (v) present an identification signal to a sender of
8 said additional data packet identifying said additional data packet as discarded.

1 2. The circuit according to claim 1, wherein said test circuit is further configured
2 to discard said additional data packet without storing said additional data packets in said buffer in
3 response to said number being at least as great as a second threshold.

3. CANCELED

1 4. The circuit according to claim 1, wherein said test circuit is further configured
2 to present a rate signal to said sender in a slow rate condition in response to said number being
3 greater than said first threshold.

1 5. The circuit according to claim 4, wherein said test circuit is further configured
2 to present said rate signal to said sender in a full rate condition in response to said number being less
3 than said first threshold.

1 6. The circuit according to claim 1, wherein said probabilistic test is based upon
2 a precedence.

1 7. The circuit according to claim 1, wherein said probabilistic test is based upon
2 a priority.

1 8. The circuit according to claim 1, wherein said probabilistic test is based upon
2 a volume rate.

1 9. The circuit according to claim 1, wherein said number is a time average of
2 said data packets in said buffer.

1 10. The circuit according to claim 9, wherein said test circuit is further configured
2 to (i) discard said additional data packet in response to said number being at least as great as a
3 second threshold, (ii) present a rate signal in a first condition in response to said number being
4 greater than said first threshold, and (iii) present said rate signal in a second condition in response
5 to said number being less than said first threshold.

1 11. A method for managing congestion of a plurality of data packets in a buffer,
2 comprising the steps of:

3 (A) monitoring a number of said plurality of data packets in said buffer;

4 (B) receiving an additional data packet to said plurality of data packets;

5 (C) storing said additional data packet into said buffer in response to said number
6 being less than a first threshold;

7 (D) discarding said additional data packet in accordance with a probabilistic test
8 without said additional data packets reaching said buffer in response to said number being greater
9 than said first threshold; and

10 (E) presenting an identification signal to a sender of said additional data packet
11 identifying said additional data packet as discarded.

1 12. The method according to claim 11, further comprising the step of:
2 discarding said additional data packet in response to said number being at least as
3 great as a second threshold.

13. CANCELED

1 14. The method according to claim 11, further comprising the step of:
2 presenting a rate signal to said sender in a slow rate condition in response to said
3 number being greater than said first threshold.

1 15. (PREVIOUSLY PRESENTED) The method according to claim 14, further
2 comprising the step of:
3 presenting said rate signal to said sender in a full rate condition in response to said
4 number being less than said first threshold.

1 16. The method according to claim 11, further comprising the step of:
2 time averaging said number prior to step (C).

1 17. A circuit comprising:
2 means for monitoring a number of a plurality of data packets in a buffer;
3 means for receiving an additional data packet to said plurality of data packets;
4 means for storing said additional data packet into said buffer in response to said
5 number being less than a first threshold;
6 means for discarding said additional data packet without storing said additional data
7 packets in said buffer in accordance with a probabilistic test in response to said number being greater
8 than said first threshold; and
9 means for presenting an identification signal identifying said additional data packet
10 as discarded.

1 18. The circuit according to claim 2, wherein said test circuit is further configured
2 to present a rate signal to a sender of said additional data packets in a stop transmission condition
3 in response to said number being greater than said second threshold.

1 19. The method according to claim 12, further comprising the step of:
2 presenting a rate signal to a sender of said additional data packets in a stop
3 transmission condition in response to said number being greater than said second threshold.

1 20. The circuit according to claim 9, wherein said number is determined before
2 said additional data packet is permitted into said buffer.

1 21. The circuit according to claim 1, further comprising a queuing management
2 circuit disposed between said buffer and an output and configured to transfer said data from said
3 buffer to said output.

1 22. The circuit according to claim 17, further comprising means for managing
2 presentation of said data packets from said buffer to an output.

IX EVIDENCE APPENDIX

The following evidence was submitted in the Amendment After Final on May 6, 2005. The Amendment After Final was the first opportunity to submit the evidence after the Examiner raised the issue of an implicit signal for the first time in the Final Office Action of March 9, 2005.

Encyclopedia of Networking, Electronic Edition

Tom Sheldon

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- The receiver can *acknowledge* receipt of datagrams to provide assurance of delivery to the sender. This acknowledgment scheme is used in a number of ways, as discussed in a moment.
- *Flow control* provides a way for two systems to actively cooperate in the transmission of data to prevent overflows and lost datagrams caused by fast senders. This feature lets transmitting systems quickly adapt to the traffic loads on the network and/or the available buffer size on the receiver.
- *Sequencing* is a technique for numbering datagrams so the receiver can put them back into the correct order and determine if datagrams are missing.
- A *checksumming* feature is used to ensure the integrity of packets.

TCP Segments

A TCP segment is the official name for what is often loosely referred to as a packet (where a packet is some package of information). A segment is the actual entity that TCP uses to exchange data with its peers. The segment is what gets encapsulated into an IP datagram and transmitted across the network. Segments have a 20-byte header and a variable-length Data field. The fields of the TCP segment are described below and pictured in Figure T-4. Keep in mind that either station may send a segment that contains just header information and no data to provide the other system with connection information, such as an acknowledgment that a segment was received.

- **Source and destination port** Contains the port number of the sockets at the source and destination sides of the connection.
- **Sequence number** This field contains information for the receiver, which is a sequential number that identifies the data in the segment and where it belongs in the stream of data that has already been sent. The receiver can use the sequence number to reorder packets that have arrived out of order. It can also indicate that a segment is missing.
- **Acknowledgment number** This field is used by the receiver to indicate to the sender in a return message that it has received a previously sent packet. The number in this field is actually the sequence number for the next segment that the receiver expects. That number is calculated by incrementing the value in the Sequence Number field.
- **TCP header length** Specifies the length of the header.
- **Codes** This field contains the following bit codes, which serve as flags to indicate specific conditions:

URG (urgent) This bit is set to 1 if there is information in the Urgent Pointer field of the header.

ACK (acknowledgment) If ACK is set to 1, it indicates that the segment is part of an ongoing conversation and the number in the Acknowledgment Number field is valid. If this flag is set to 0 and SYN is set to 1, the segment is a request to establish a connection.

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X. RELATED PROCEEDINGS APPENDIX

None